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THE HAWK MOTHS (LEPIDOPTERA: SPHINGIDAE) OF CHRISTMAS ISLAND, INDIAN OCEAN

By M. S. Moulds

Research Associate, Australian Museum, 6-8 College St, Sydney, N.S.W. 2000

Abstract

Details are recorded from three collections of hawk moths from Christmas Island previously unstudied. The known species from the island are listed and two species, *Macroglossum prometheus* Boisduval and *Hippotion depictum* Dupont are recorded for the first time.

Introduction

Christmas Island, Indian Ocean, lies some 360 km south of the Indonesian island of Java and 1400 km from Western Australia. It is isolated from other landmasses and although small (approximately 137 sq km), is covered for the most part in lush tropical rainforest ideally suited to hawk moths.

Although Ridley (1891) briefly records a "Sphingida, sp." the first specific listing of hawk moths is that of Hampson (1900) who records five species. Tweedie (1933) reports on taking three of the species listed by Hampson and later Pendlebury (1947) records two additional species making a total of seven species known from the Island. There has been no further mention of Christmas Island hawk moths by any author.

Recently the island was visited by Mr Robert B. Lachlan (RBL) who collected many insects including a number of hawk moths which he kindly allowed me to study. Additional material is also now available in the collections of the Australian National Insect Collection (ANIC) and Western Australian Museum (WAM). From all this material I summarise below the hawk moths now known from Christmas Island including two previously unrecorded species, *Macroglossum prometheus* Boisduval and *Hippotion depictum* Dupont.

List of species

Agrius convolvuli (L.)

Material examined.—1 ♀, Christmas Is., 29.i.1985, R. B. Lachlan (RBL). 2 ♂♂, Settlement, 5, 15.x.1964, T. G. Campbell; 1 ♀, Settlement, 25.x.1964, Mr Maxwell (ANIC).

There are records for January, March, April and October but reported by Pendlebury (1947) as "fairly common all through the year".

Psilogramma menephron menephron (Cramer)

Material examined.–4 ♀♀, Christmas Is., 21,23,25.i.1985, R. B. Lachlan (RBL, MSM). 1 ♂, Settlement, 25.x.1964, T. G. Campbell (ANIC).

There are records for October, December and January. Listed by Hampson (1900) as *Pseudosphinx discistriga* Walker.

Cephonodes picus picus (Cramer)

Material examined.–1 ♀, Blowhole, 29.vi.1961, G. F. Mees, WAM Reg. No. 85/1123; 1 ♂, ? Christmas Island, WAM Reg. No. 85/1124 (WAM). 4 ♂♂, 1 ♀, Christmas Is., 12,13.i.1985, R. B. Lachlan (RBL, MSM). 8 ♂♂, 7 ♀♀, Settlement, 2-25.x.1964, T. G. Campbell (ANIC).

Recorded by all previous authors. Pendlebury (1947) adds that it is "common in open spaces through the dry weather". There are records for Sep.-March, May.

Listed by Hampson (1900) as *C. hylas* (L.). *C. picus* is clearly distinguished by the spines present at the bases of the fore tibia which are absent in *C. hylas.*

Gnathothlibus erotus erotus (Cramer)

Material examined.–1 ♂, 1 ♀, Silver City, 6.ix.1969 and 3.x.1969, S. Slack-Smith and A. Paterson, WAM Reg. Nos 77/216 and 85/1122 (WAM). 3 ♂♂, 2 ♀♀, Christmas Is., 16,20,25,29.i.1985, R. B. Lachlan (RBL, MSM). 1 ♀, Settlement, 15.x.1964, R. Ashley; 1 ♀, Settlement, 13.x.1964, D. Cougle; 1 ♀, Settlement, 12.x.1964, T. G. Campbell (ANIC).

A common species recorded for July to January, March and May.

Daphnis placida placida (Walker)

Material examined.–1 ♂, Settlement, 2.x.1964, T. G. Campbell (ANIC).

Previously recorded only by Pendlebury (1947). Specimens have been taken during October, January and March.

Macroglossum prometheus prometheus Boisduval

Material examined.–1 ♀, ? Christmas Island, WAM Reg. No. 77/218 (WAM).

Previously unrecorded from Christmas Island. The WAM specimen which matches perfectly the specimen figured in Bell and Scott (1937) bears a question mark on its locality label but most likely did come from the Island. This is a common species in Java (Dupont and Roepke 1941) but a rarity in Australia where it is known only from subspecies *lineatum* Lucas occurring in the extreme north east of Northern Territory and north-eastern Queensland (Moulds 1985).

Hippotion velox (Fabricius)

Material examined.–2 ♂♂, Flying Fish Cove, 27.vi.1961 and 7.vii.1961, G. F. Mees, WAM Reg. Nos 77/209 and 77/210 (WAM). 2 ♂♂, 1 ♀, Christmas Is., 23,25.i.1985, R. B. Lachlan (RBL, MSM). 4 ♂♂, 1 ♀, Settlement, 5-19.x.1964, T. G. Campbell; 1 ♂, Settlement, 21.x.1964, D. Powell (ANIC).

There are records for all months from June to April. Recorded by all previous authors; listed by Hampson (1900) as *Chaerocampa vigil* (Guér.).

Hippotion depictum Dupont

Material examined.–2 ♂♂, 6 ♀♀, Christmas Is., 16,24,26,29,30,31.i.1985, R. B. Lachlan (RBL, MSM). 1 ♂, 2 km WSW of Waddle Hill, x.1964, L. Hill (ANIC).

Previously unrecorded from Christmas Island.

Theretra latreillei lucasii (Walker)

Material examined.–2 ♂♂, Christmas Is., 27,29.i.1985, R. B. Lachlan (RBL).

Hampson (1900) and Pendlebury (1947) record a single specimen each taken in December and May respectively.

Discussion

The sphingid fauna of Christmas Island is clearly allied to that of Java rather than to Australia. All species so far known from Christmas Island are abundant in Java (cf. Dupont and Roepke 1941) while only *A. convolvuli* occurs in Western Australia.

I would expect the sphingid fauna of Christmas Island to be considerably larger than that now known. The food plants, or plants closely related, of many Javanese hawk moths occur on the island (compare plant list of Ridley 1906, with Dupont and Roepke 1941) and it would not be unreasonable to expect the associated hawk moths. Further collecting during, and immediately after, the wet season should not only add to the list of known species but should also reveal the larval food plants used by these moths on Christmas Island. For the benefit of intending collectors I provide below a key to last instar larvae of the species known from Christmas Island compiled from a study of exotic material.

Key to last instar larvae

It should be noted that the colour of larvae of a given species can often show considerable variation, both in the arrangement of markings and in ground colour. For most species two principle colour forms occur, a predominantly green form and a predominantly black (sometimes brown) form.

1. Abdominal segment 1 (and often other abdominal segments with a subdorsal "eye spot" (dorsal to spiracle) 2
– Abdominal segment 1 without an "eye spot" (not to be confused with a spot that may surround spiracle) 5

2. "Eye spot" on abdominal segment 1 similar in size and colour to "eye spot" on at least two other segments . . . . *Gnathothlibus erotus erotus*
– "Eye spot"on abdominal segment 1 unique, clearly of different pigmentation from any other abdominal "eye spot" that may be present. . . . 3

3. "Eye spot" on abdominal segment 1 always with some red pigmentation. . . . . *Theretra latreillei lucasii*
– "Eye spot" on abdominal segment 1 without red pigmentation 4

4. Caudal horn curved forwards, long (about equal to body diameter); "eye spot" on abdominal segment 1 only, the other segments clearly without "eye spots" . . . . . *Hippotion velox*
– Caudal horn straight or nearly so, short (less than half body diameter); subdorsal "eye spots" or blotches on abdominal segments 1-7, those on segments 2-7 similar but clearly different from that on segment 1. . . . . *Hippotion depictum*

5. Caudal horn curved backwards 6
— Caudal horn either straight, almost straight, or gently curved in a shallow 'S' 7

6. Head with each cheek bearing at least one distinct, dark, vertical stripe . . . . . *Agrius convolvuli*
— Head of uniform colour without vertical stripes . . . . . *Daphnis placida placida*

7. Dorsal shield (immediately behind head) as a distinct sclerotised plate, slightly raised, clearly visible to naked eye and coarsely granulated with short blunt spine-like tubercles that are clearly vivible to naked eye; thoracic segments smooth, without tubercles . . *Cephonodes picus picus*
— Not with above combination of characters 8

8. Large larva (up to 90 mm long); always greenish in colour (never brown or black) with whitish oblique lateral stripes on abdominal segments; caudal horn coarsely granulated by spine-like tubercles, some much larger than others and clearly visible to naked eye . . . . . *Psilogramma menephron menephron*
— Small larva (up to 45 mm); either green, brown or black and always without oblique lateral stripes on abdominal segments; caudal horn finely granulated to naked eye, the tubercles all of similar size . . . . . *Macroglossum prometheus prometheus*

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